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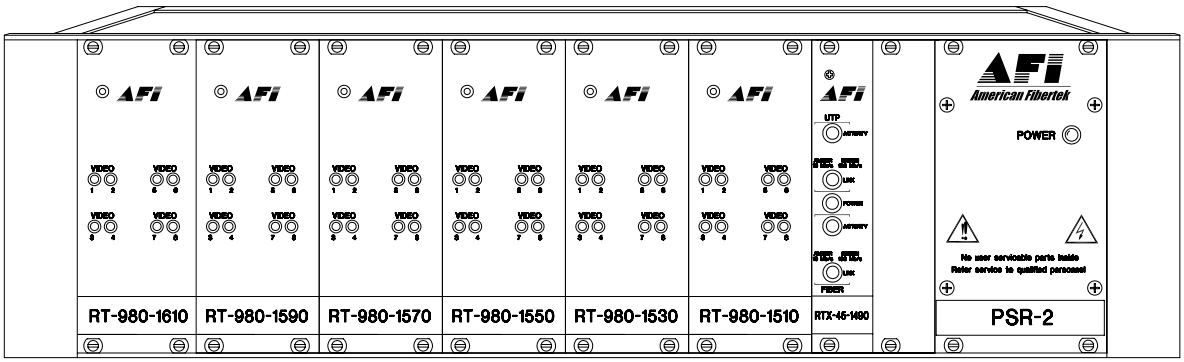

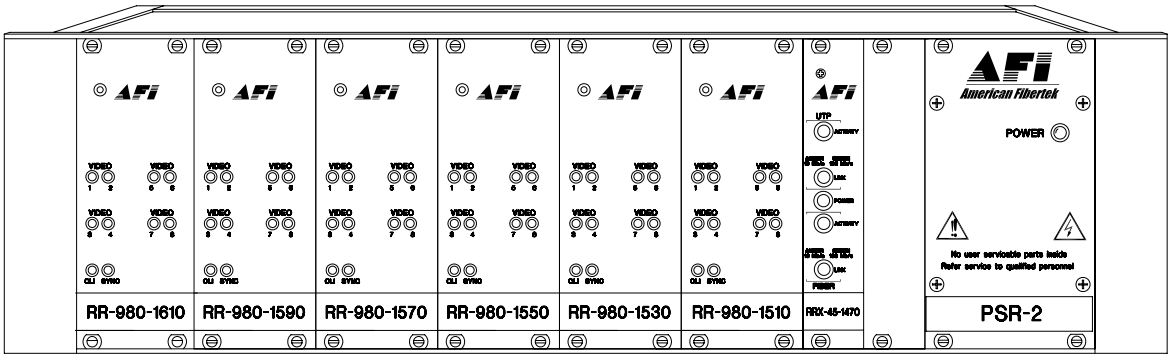

Instruction Manual

RT-94845SL
RR-94845SL
Forty-Eight Channel Video Multiplexer With Bi-directional Ethernet Data

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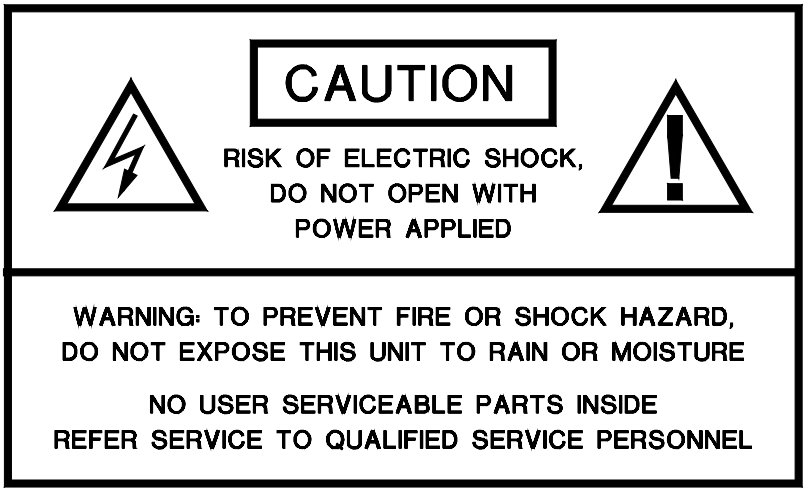
CAUTION
RISK OF ELECTRIC SHOCK,
DO NOT OPEN WITH
POWER APPLIED
WARNING: TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICE TO QUALIFIED SERVICE PERSONNEL

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INSTALLATION AND OPERATION INSTRUCTIONS

INTRODUCTION

Thank you for purchasing your American Fibertek Series 94845SL singlemode forty-eight channel video multiplexer with bi-directional Ethernet data. Please take a few minutes to read these installation instructions in order to obtain the maximum performance from this product.

FUNCTIONAL DESCRIPTION

The 94845SL Series units operate as a transmitter / receiver pair for the digital transmission of forty-eight simultaneous NTSC or PAL video signals along with one channel of bi-directional Ethernet data over one singlemode fiber optic cable. The Ethernet data channel will auto-configure for a transmission speed of either 10 Mb/s or 100 Mb/s. An external switch is provided for selecting MDI (straight) or MDIX (crossover) Ethernet connections.

The RT-94845SL transmitter accepts up to forty-eight video inputs in six groups containing eight videos and multiplexes each group into a high speed serial data stream. The first group's serial data stream modulates a laser at 1510nm wavelength. The second group's serial data stream modulates a laser at 1530nm wavelength. This pattern is repeated for group's three through six using wavelengths 1550nm through 1610nm respectively. A Course Wave Division Multiplexer (CWDM) combines these six wavelengths, along with the forward data wavelength of 1490nm and the return data wavelength of 1470nm, onto a single optical output port for connection to the fiber transmission system. Correspondingly, the RR-94845SL receiver converts the optical signal to forty-eight independent video output signals and one data output while transmitting the one return data channel.

The 94845SL Series product is designed to operate over an optical loss budget range of 0dB to 21dB on 9um singlemode fiber. Refer to the product specification sheet for additional performance data.

INSTALLATION

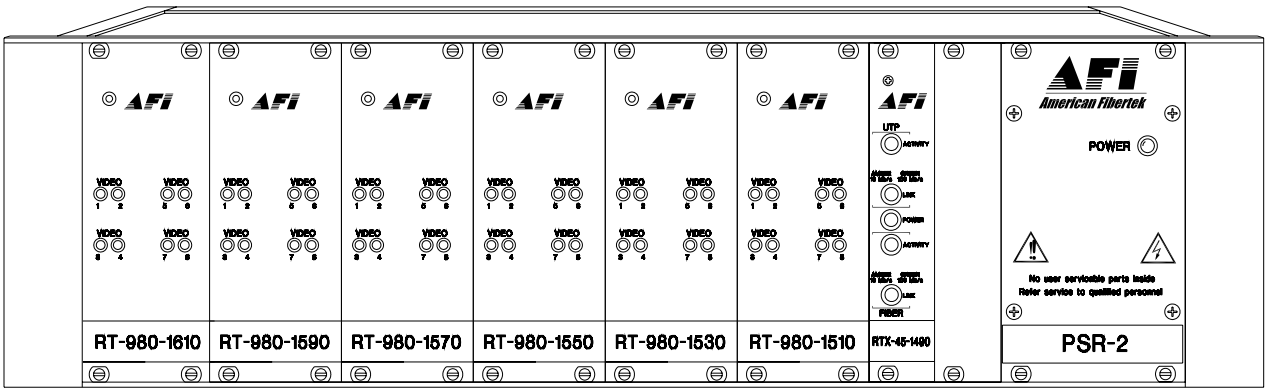
THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70 AND LOCAL CODES.

RT-94845SL COMPONENTS

The RT-94845SL consists of the following components:

1) RT-980-1510	1) RT-980-1570	1) RTX-45-1490	1) SR-20
1) RT-980-1530	1) RT-980-1590	8) PCSC/UPC-0.3	1) PSR-2
1) RT-980-1550	1) RT-980-1610	1) MTX-CWDM-8	1) BPS-1

The individual 980 series video rack cards that make up the RT-94845SL are combined in a rack mount configuration using the SR-20 subrack. Please refer to the instruction manuals for the SR-20 and the PSR-2 for information on the installation of the subrack with its power supply. The individual 980 series rack cards can slide into any of the open slots in the SR-20 subrack, however, the recommended configuration is shown below. This configuration starts with a blank panel next to the PSR-2 power supply followed by the RTX-45-1490 data card. The lowest wavelength video card, the RT-980-1510 continues the configuration which ends with the highest wavelength card, the RT-980-1610, at the left side of the rack. Following this configuration allows the fiber port on the back of the 980 series card to best line up with its associated port on the CDWM unit. Use a small screwdriver to push and lock the ¼ turn fasteners into place. The Multi-Channel Digital Video CWDM that optically multiplexes the six video rack cards and one data rack card used in the RT-94845SL is labeled MTX-CWDM-8. It should be mounted directly below its corresponding SR-20 subrack with a ½ RU space between the two components. To maximize the performance and life of the system, installing a fan above the SR-20 subrack is recommended to pull air up across the RT-94845SL components.



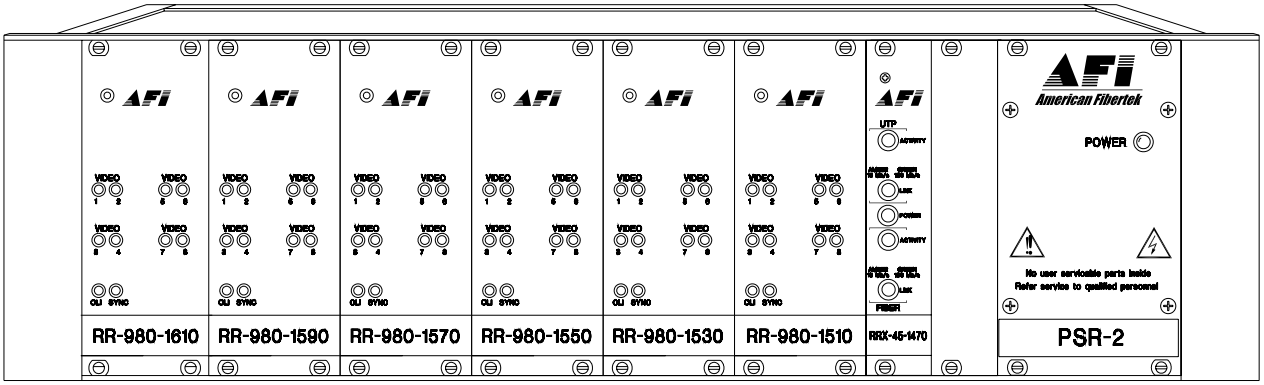
RT-94845SL

RR-94845SL COMPONENTS

The RR-94845SL consists of the following components:

1) RR-980-1510	1) RR-980-1570	1) RRX-45-1470	1) SR-20
1) RR-980-1530	1) RR-980-1590	8) PCSC/UPC-0.3	1) PSR-2
1) RR-980-1550	1) RR-980-1610	1) MRX-CWDM-8	1) BPS-1

The 980 series video rack cards and the data rack card that make up the RR-94845SL are installed in a manner similar to the RT-94845SL (see drawing below). The Multi-Channel Digital Video CWDM that optically demultiplexes the six video rack cards and the one data card used in the RR-94845SL is labeled MRX-CWDM-8. Mounting procedures and recommendations should follow those used for the RT-94845SL.



RR-94845SL

POWER SOURCE

Power to the 980 series and 45 series rack cards is supplied by the subrack. Please refer to the SR-20 and PSR-2 instructions for further details.

The CDWM unit is a passive device which does not require any power source.

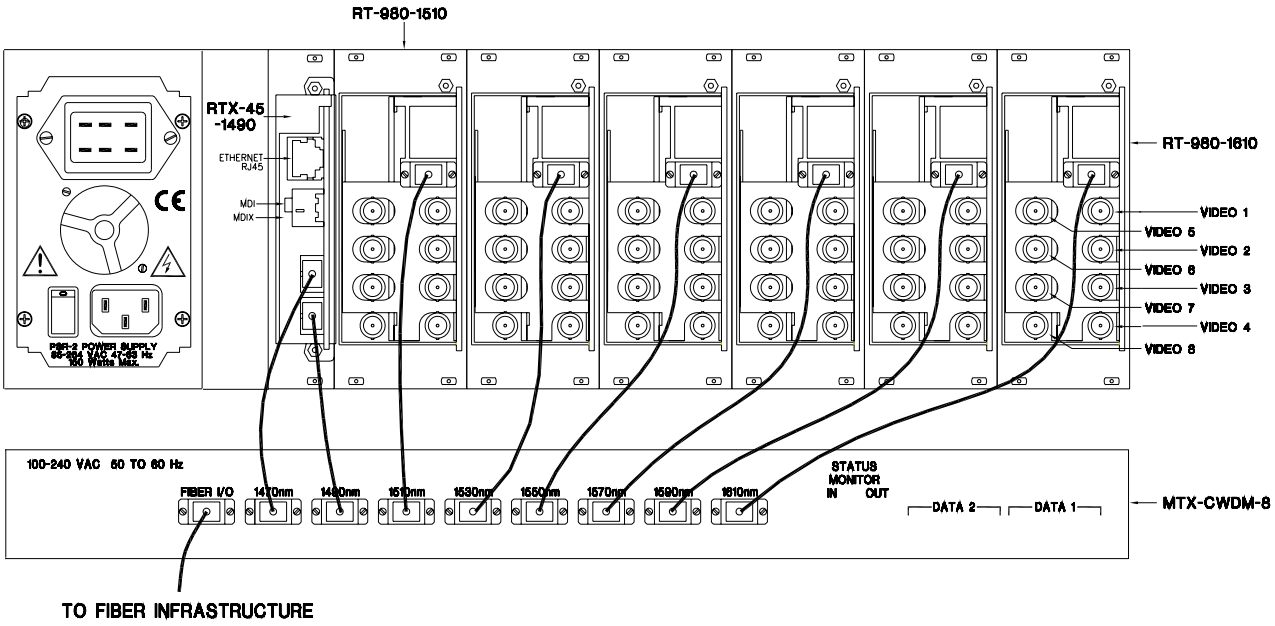
POWER CONNECTION

Power is supplied to the individual 980 series and 45 series units via a four finger backplane connector. The individual components can be inserted into the subrack or removed from the subrack with power applied to the backplane. Please refer to the SR-20 and PSR-2 instructions for details.

The CDWM unit is a passive device which does not require any power connection.

RT-94845SL FIBER CONNECTIONS

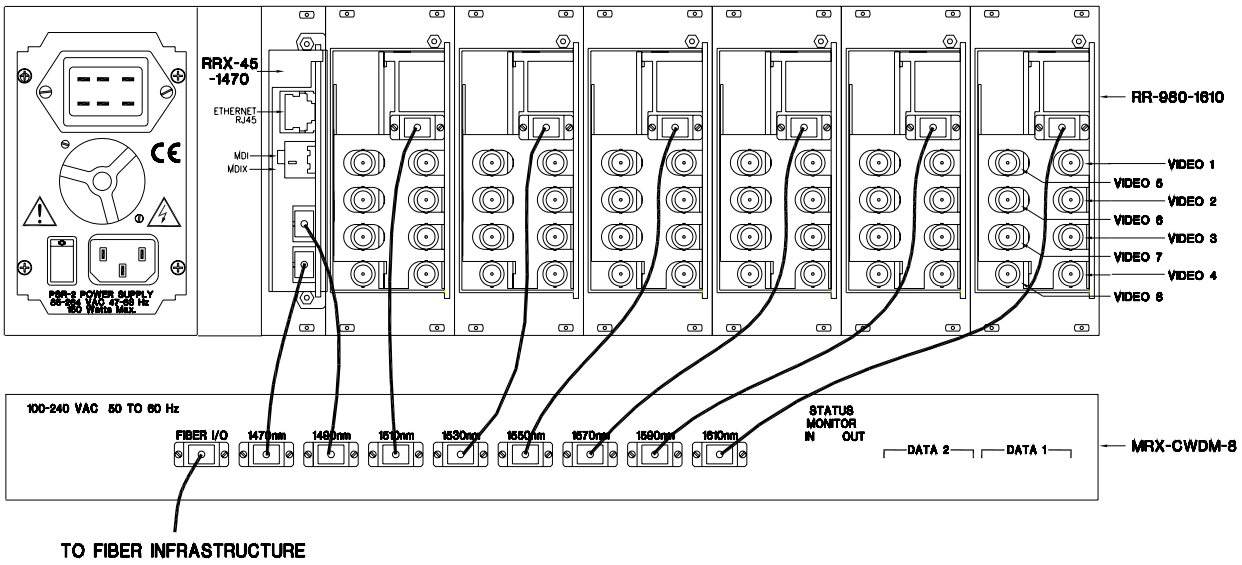
The fiber optic connection to the user's infrastructure is made via a SC connector located at the back of the CDWM unit next to the power input. Be sure to allow sufficient room for the required minimum bend radius of the fiber cable used. SC patchcords are supplied for the intra-fiber connections between the CWDM and each of the 980 series and 45 series units. The wavelength listed for each port on the CWDM must correlate with the wavelength listed on the 980 series unit to which that port is attached. The top port of the RTX-45-1490 connects to the 1470nm port on the CWDM. The bottom port of the RTX-45-1490 connects to the 1490nm port on the CWDM. Follow the drawing below for the proper connections of the fiber patchcords.



RT-94845SL

RR-94845SL FIBER CONNECTIONS

The fiber optic connections on the RR-94845SL are similar to those for the RT-94845SL **with the exception of the RRX-45-1470 data card.** On the RRX-45-1470, the bottom port connects to the 1470nm port on the CWDM. The top port of the RRX-45-1470 connects to the 1490nm port on the CWDM. Follow the drawing on the next page for the proper connections of the fiber patchcords.



RR-94845SL

VIDEO INPUT / OUTPUT CONNECTIONS

Video input and output connections are located on the rear of the 980 series units. A BNC connector is provided for each channel. The video inputs are connected to an appropriate 75Ω baseband video source such as a camera or a video recorder output. The 75Ω video outputs can be looped through typical baseband video inputs of switchers, recorders and other equipment as required. For proper operation, the outputs must be terminated with 75Ω. For optimum performance the video cables should be the shortest length of coax practical.

The location of a video input to the RT-94845SL will be mirrored as a video output at the RR-94845SL. For example, the Channel 2 video input on the RT-980-1550 will become the Channel 2 video output on the RR-980-1550 after traveling across the fiber infrastructure.

ETHERNET DATA INPUT / OUTPUT CONNECTIONS

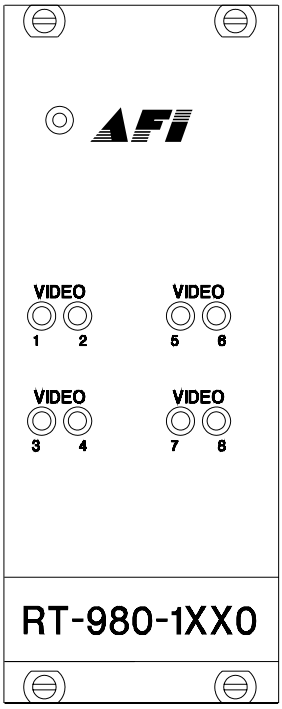
A RJ45 connector is used to connect UTP Ethernet data to the 45 series units.

MDI / MDIX Switch

All Ethernet equipment is designed with a MDI interface port or a MDIX interface port. The terms MDI and MDIX refer to a specific orientation of the transmit data signal and the receive data signal on the RJ45 connection to the unit. Some units have a switch built into them that allows you to choose the port to be either MDI or MDIX. Other units can auto-configure to either speed. Typically, a computer or terminal is wired as an MDI port connection and a network hub or switch is wired as an MDIX connection. The MDI configured device is connected to the MDIX device with a straight through Ethernet patch cable. Whenever a connection from one MDI device to another MDI device is required, the use of a crossover cable is required to reorient the signals, making the first device appear as if it was configured as MDIX. The RTX-45-1490 and RRX-45-1490 are shipped in the MDI configuration. Therefore, when connecting to a MDI configured device a crossover cable should be used. In the event the proper cable is not available, an external switch is provided at the rear of the 45 series unit for reconfiguring the unit as a MDIX port. **If the 45 series unit is connected to an auto-configure device, it is not necessary to change the MDI / MDIX switch.**

RT-980 SERIES STATUS INDICATORS

Each of the RT-980 series transmitters provides the following front panel LED status indicators to aid in installation and troubleshooting:



VIDEO 1 THROUGH VIDEO 8

A bi-color LED indicator is provided for the each of the eight video inputs to the RT-980 series transmitters. Video status associated with each of these LED's is summarized below.

Video Presence LED	Video Status
Green	Proper Input Video Present
Red	Input Video Not Detected

RTX-45-1490 STATUS INDICATORS

The RTX-45-1490 transceiver provides the following LED status indicators to aid in troubleshooting:

UTP ACTIVITY

A green LED indicator monitors the presence of any data signals into the RTX-45-1490 from the twisted pair wires. Input status associated with this LED is summarized below.

UTP Activity Indicator	Ethernet Data Status
Green	Data Packets Present
Off	Data Packets Not Detected

UTP LINK

A bi-color LED indicator monitors the speed of any data signals present through the RTX-45-1490. Data status associated with this LED is summarized below.

UTP Link Indicator	Ethernet Data Status / Speed
Green	100 Mb/s Full or Half Duplex
Amber	10 Mb/s Full or Half Duplex
Off	Data Packets Not Detected

POWER

A green LED indicator monitors the presence of DC voltage into the RTX-45-1490 from the subrack. DC voltage status associated with this LED is summarized below.

Power Indicator	DC Input Voltage Status
Green	DC Voltage Present
Off	Check Subrack Power Supply

FIBER ACTIVITY

A green LED indicator monitors the presence of any data signals into the RTX-45-1490 from the fiber cable. Input status associated with this LED is summarized below.

Fiber Activity Indicator	Ethernet Data Status
Green	Data Packets Present
Off	Data Packets Not Detected

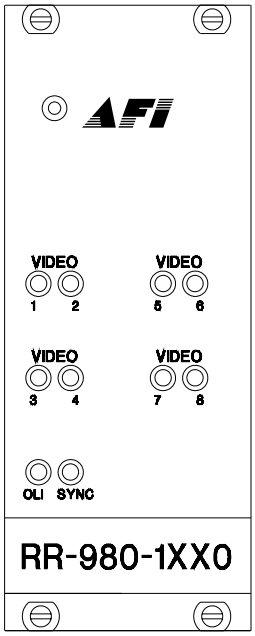
FIBER LINK

A bi-color LED indicator monitors the speed of any data signals present through the RTX-45-1490. Data status associated with this LED is summarized below.

Fiber Link Indicator	Ethernet Data Status / Speed
Green	100 Mb/s Full or Half Duplex
Amber	10 Mb/s Full or Half Duplex
Off	Data Packets Not Detected

RR-980 SERIES STATUS INDICATORS

Each of the RR-980 series receivers provides the following front panel LED status indicators to aid in installation and troubleshooting:



VIDEO 1 THROUGH VIDEO 8

A bi-color LED indicator is provided for the each of the eight video outputs from the RR-980 series receivers. Video status associated with each of these LED's is summarized below.

Video Presence LED	Video Status
Green	Proper Output Video Present
Red	Output Video Not Detected

OLI

A bi-color LED indicator monitors the power of the optical input signal that is being received at the RR-980 series unit from video channels one through eight of its corresponding RT-980 series unit. AC power and optical input status associated with this LED are summarized below.

Optical Level Indicator	AC Power Status	Optical Status
Green	On	Proper Optical Input Power Present
Red	On	Optical Input Not Detected
Off	Off	Check Power Supply Input

SYNC

A bi-color LED indicator is provided to monitor the proper serialization of the electrical video data stream through the RR-980 series unit. Each group of eight videos has its own SYNC indicator. Sync status associated with this LED is summarized below.

Sync LED	Sync Status
Green	Proper Data Stream Serialization Present
Red	Data Stream Serialization Not Detected

RRX-45-1470 STATUS INDICATORS

The RRX-45-1470 transceiver provides the following LED status indicators to aid in troubleshooting:

UTP ACTIVITY

A green LED indicator monitors the presence of any data signals into the RRX-45-1470 from the twisted pair wires. Input status associated with this LED is summarized below.

UTP Activity Indicator	Ethernet Data Status
Green	Data Packets Present
Off	Data Packets Not Detected

UTP LINK

A bi-color LED indicator monitors the speed of any data signals present through the RRX-45-1470. Data status associated with this LED is summarized below.

UTP Link Indicator	Ethernet Data Status / Speed
Green	100 Mb/s Full or Half Duplex
Amber	10 Mb/s Full or Half Duplex
Off	Data Packets Not Detected

POWER

A green LED indicator monitors the presence of DC voltage into the RRX-45-1470 from the subrack. DC voltage status associated with this LED is summarized below.

Power Indicator	DC Input Voltage Status
Green	DC Voltage Present
Off	Check Subrack Power Supply

FIBER ACTIVITY

A green LED indicator monitors the presence of any data signals into the RRX-45-1470 from the fiber cable. Input status associated with this LED is summarized below.

Fiber Activity Indicator	Ethernet Data Status
Green	Data Packets Present
Off	Data Packets Not Detected

FIBER LINK

A bi-color LED indicator monitors the speed of any data signals present through the RRX-45-1470. Data status associated with this LED is summarized below.

Fiber Link Indicator	Ethernet Data Status / Speed
Green	100 Mb/s Full or Half Duplex
Amber	10 Mb/s Full or Half Duplex
Off	Data Packets Not Detected

This unit complies with 21 CFR 1040.10 and 1040.11

LIFETIME WARRANTY INFORMATION

American Fibertek, Inc warrants that at the time of delivery the products delivered will be free of defects in materials and workmanship. Defective products will be repaired or replaced at the exclusive option of American Fibertek. A Return Material Authorization (RMA) number is required to send the products back in case of return. All returns must be shipped prepaid. This warranty is void if the products have been tampered with. This warranty shall be construed in accordance with New Jersey law and the courts of New Jersey shall have exclusive jurisdiction over this contract. **EXCEPT FOR THE FOREGOING WARRANTY, THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, EXPRESSED OR IMPLIED, WHICH EXTENDS BEYOND THE WARRANTY SET FORTH IN THIS AGREEMENT.** In any event, American Fibertek will not be responsible or liable for contingent, consequential, or incidental damages. No agreement or understanding, expressed or implied, except as set forth in this warranty, will be binding upon American Fibertek unless in writing, signed by a duly authorized officer of American Fibertek.

SERVICE INFORMATION

There are no user serviceable parts inside the unit.
In the event that service is required to this unit, please direct all inquiries to:

American Fibertek, Inc.
120 Belmont Drive
Somerset, NJ 08873

Phone: (877) 234-7200
Phone: (732) 302-0660
FAX (732) 302-0667

E-mail: techinfo@americanfibertek.com